

## EDITORIAL COMMENT

# Catheter-Induced Coronary Dissection

## Keep Calm and Don't Inject\*



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Catheter-induced dissection is an infrequent, but potentially severe complication that may occur during diagnostic coronary angiography or percutaneous coronary intervention. Whereas minor degrees of dissection are usually straightforward to treat, management of more complex dissections are often challenging. Immediate stenting is usually the preferred treatment in most cases. This includes coronary dissections with retrograde involvement of the aorta as long as the aortic dissection is not extensive (1). It is essential to have a clear algorithm for treating this complication should it occur (Figure 1). In this issue of *JACC: Case Reports*, Hashmani et al. (2) provide valuable insights into the management of catheter-induced coronary artery dissection and highlight the usefulness of intravascular ultrasound (IVUS) in managing this complication.

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One of the most important aspects of management of significant dissection once recognized is to avoid any further antegrade injections. Antegrade injections of any form will pressurize the artery causing hydraulic dissection into the distal vessel and may also extend the dissection retrogradely into the aorta. Depending on the severity of the dissection and the territory of myocardium supplied by the affected vessel, hemodynamic support may be required. It is important to choose a guide catheter that avoids deep coronary engagement and reduces bias toward the false lumen. Short-tip Judkins right- or left-guide

catheters are often good choices in this circumstance. A nonhydrophilic workhorse guidewire with a low tip load should be chosen to attempt wiring of the true lumen as this will provide more tactile feedback reducing the chance of extending the dissection with the guidewire.

The presence of resistance to guidewire progress, particularly if the dissected artery does not have atheromatous disease, or formation of a sigmoid or knuckle shape by the guidewire suggests the guidewire is in the false lumen or subintimal space. Conversely, if the wire passes distally without resistance and is able to enter multiple side branches, this suggests the wire is in the true lumen. However, in extensive dissections or if there is pre-existing atheroma, it may be very difficult to know whether the wire is in the true or false lumen.

As highlighted by Hashmani et al. (2), IVUS is extremely valuable in managing coronary dissections. IVUS is able to confirm the dissection entry point and confirm whether the guidewire is in the true or false lumen. If the guidewire is in the false lumen, then the IVUS can be left in place on the original wire and parallel wiring performed. This has the benefit of providing greater stability if the guide is disengaged to allow wiring of ostial dissection and also allows real-time IVUS guidance to confirm the second wire is in the true lumen. Once the true lumen wiring has been achieved, then IVUS can be used to assess the length of dissection, stent sizing, and optimization following stent placement. It is important to appreciate that stent placement can compress and propagate the intramural hematoma. Therefore, it is important to have an adequate stent margin, usually at least 5 mm, when planning stent length.

Optical coherence tomography is recommended by Hashmani et al. (2) as an alternative to IVUS to image the extent of the dissection and confirm wire placement. However, use of optical coherence tomography

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coronary artery bypass grafting is an effective alternative treatment (7). However, there are often significant delays that may result in irreversible myocardial damage.

Catheter-induced coronary artery dissection is a rare but potentially life-threatening complication. Operators should be familiar with techniques that

minimize dissection extension and facilitate wiring and stenting of the true lumen.

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## REFERENCES

1. Tanasie C, Chandonnet M, Chin A, et al. Catheter-induced aortic dissection after invasive coronary angiography: evaluation with MDCT. *AJR Am J Roentgenol* 2011;197:1335-40.
2. Hashmani S, Tuzcu E, Hasan F. Successful bailout stenting for iatrogenic right coronary artery dissection in a young male. *J Am Coll Cardiol Case Rep* 2019;1:108-12.
3. Costello-Boerrigter LC, Salomon C, Bufe A, Lapp H. The novel use of retrograde CTO PCI techniques as a rescue strategy for an acute right coronary artery occlusion due to iatrogenic dissection. *J Cardiol Cases* 2018;7:89-91.
4. Ierovante N, Sanghvi K, Varghese V. Emergent distal vessel re-entry technique for iatrogenic coronary artery dissection. *Cath Lab Digest* 2019 Feb [E-pub ahead of print].
5. Christopoulos G, Kotsia AP, Brilakis ES. The double-blind stick-and-swap technique for true lumen reentry after subintimal crossing of coronary chronic total occlusions. *J Invasive Cardiol* 2015;27:E199-202.
6. Carlino M, Al-Lamee R, Ielasi A, et al. Treatment of iatrogenic occlusive coronary dissections: a novel approach. *EuroIntervention* 2011;7:106-11.
7. Verevkin A, von Aspern K, Leontyev S, Lehmann S, Borger MA, Davierwala PM. Early and long-term outcomes in patients undergoing cardiac surgery following iatrogenic injuries during percutaneous coronary intervention. *J Am Heart Assoc* 2019;8:e010940.

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